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1999 Montana ESEA Title II Eisenhower Study

*Teacher Self-Assessment of Content Knowledge and Student Performance
With Regard To Montana's Reading and Mathematics Content Standards
And
Survey of Professional Development Quality*



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EXECUTIVE SUMMARY

Montana Office of Public Instruction
Nancy Keenan, Superintendent
PO Box 202501
Helena, MT 59620-2501

The 1999 Montana ESEA Title II Eisenhower Study, including Comprehensive Report and Appendices, is available on-line at <http://www.metnet.state.mt.us> (click on "Our Services" then arrow down to "Title II"). It is available in hard copy upon request by contacting the Eisenhower Professional Development Program office at (406) 444-1852.

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1999 Montana ESEA Title II Eisenhower Study

Acknowledgements

Project Director/Editor

Christine Provance

Division of Educational Opportunity and Equity
Title II Eisenhower Professional Development Program

Survey Design

Montana Eisenhower Advisory Team (MEAT)
Survey Design Subcommittee

Nancy Coopersmith

OPI Administrator-Curriculum Services Department

Dr. Linda Peterson

OPI Administrator- School Improvement Division

Data Collection

Dick Dodge

Dodge Data Systems
Helena, Montana

Data Analysis/Recommendations

Montana Eisenhower Advisory Team (MEAT)
Mathematics/PD Quality Survey Analysis Subcommittee

Montana State Reading Council (MSRC)

Reading Survey Analysis Subcommittee

Subcommittee Facilitation

Christine Provance

June Atkins

MEAT Survey Development Subcommittee

Mike Birrer
Carol Blades
Larry Gursky
Alicia Moe
Dr. Claudette Morton
Dennis Parman
Fred Siedensticker

MEAT Survey Analysis Subcommittee

Holly Blanden
Mike Birrer
Erik Burke
Fred Longhart
Karen Longhart
Colleen Mercer
John Miller
Annette Moody
Fred Siedensticker
Dick Seitz
Karen Stout-Suenram

MSRC Survey Analysis Subcommittee

Odetta Arcand
Jerrie Boksich
Jerry Guay
Dr. Arlene Hett
Sarah McGill
Connie Metcalfe
Melody Nansel
Ron Scherry
Sue Stanton

Consultation/Review

Dr. Maurice Burke
Dr. Jan Clinard
Nancy Coopersmith
Marsha Davis
BJ Granbery
Michael Hall
Dr. Ted Hodgson
Mike Jetty
MEAT
Dr. Linda Peterson
Spencer Sartorius

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PREFACE

The 1999 Montana ESEA Title II Eisenhower Study is a major step in understanding the professional development needs of educators across the state. This study provided an opportunity for reading and mathematics teachers to assess their content knowledge and student performance in relation to the new standards. Over two thousand teachers of reading and math completed the voluntary survey. While the results are not representative of all districts in Montana, they do represent a snapshot of the current needs of at least three-fourths of teachers in the districts that participated in the survey.

The information contained in this study will be used by individual districts and professional development providers to design and deliver high quality resources to meet the needs of Montana teachers. The Office of Public Instruction, professional education associations, and higher education institutions will continue to work with teachers and school administrators to improve the quality of education for our young people.

Since 1997, we have engaged in a broad-based, inclusive, and collaborative process to build content and performance standards for Montana schools. As a result of tremendous teamwork among the Board of Public Education, teachers, administrators, parents, professional associations, the OPI staff and education professionals from across Montana, these standards are now available to Montana school districts.

I am proud of the standards and of the effort and initiative of all the people who worked to create them. The value of these standards will be derived through their implementation and use in the schools and classrooms across the state.

One message we hear loud and clear from districts across the state is their need for professional development resources – both opportunities and time. Educators need the tools and the resources to meet the challenge of school improvement; reviewing standards, selecting curriculum, designing teaching strategy, and utilizing classroom and statewide assessment instruments to measure progress. In our fast-paced technological society, how we learn and how we teach changes constantly. Highly trained, motivated teachers are the vital link in improving Montana's schools.

Professional development is an important component in successful education. I firmly believe that an investment in Montana's teachers is an investment in Montana's future.


Nancy Keenan
State Superintendent

PROJECT DIRECTOR'S NOTE

"Whatever the combination of uses, the role of systemic analysis of need is reduction of uncertainty." Jack McKillip

The enormous amount of information collected and analyzed through the 1999 Montana ESEA Title II Eisenhower Study gives one the understanding of the complex nature of identifying professional development needs, and prioritizing those needs so that focused, long-term, job-embedded professional development can occur. This report was written in order to establish baseline data prior to the initiation of any large-scale professional development initiative in the state. A follow-up teacher self-assessment of the Mathematics and Reading Standards is scheduled to be conducted in the spring of 2004 in order to measure the impact of the professional development opportunities offered since the 1999 survey.

The ESEA Eisenhower Title II program views this study as one tool in an ongoing, continually evolving collaborative inquiry process. If you have recommendations or suggestions for improving the manner in which this data is communicated, please contact the Title II Program office through our **METNET** site (see cover for address). If you use this information to change practices, policies, or secure additional funding, please let us know (through the METNET site) so that we can justify continuation of the study.

This report gives a brief summary of current program strengths, needs identified for improvement, and recommendations for initiatives. Please see the **COMPREHENSIVE REPORT OF PROFESSIONAL DEVELOPMENT NEEDS** for supporting data, detailed findings at each grade level and Appendices. The **COMPREHENSIVE REPORT** is available at our **METNET** site or in hard copy through the Title II program office.

FUTURE EFFORTS

Districts should not take lightly the task of establishing measured goals and objectives for professional development. Without data to support need, and a plan to address those needs, there is a very strong possibility that needs will go unmet and ALL teachers will not be prepared to teach ALL students to high standards. A report of district response data was sent to each participating district in June of 1999 (see Appendix C of the Comprehensive Report). The use of district response data will help districts focus professional development on local needs.

Using the framework established by the Montana Eisenhower Advisory Team in 1999, the state should consider conducting similar studies for each of the core content areas. The target date of Spring 2001 has been set for a Title II Eisenhower Teacher Self-Assessment of the content and skills within the Science and Technology Standards. A follow-up Science and Technology Teacher Self-Assessment will be conducted in the Spring of 2005 to determine professional development impact. Prior to any further comprehensive studies, Montana's Title II Eisenhower Program is committed to the development of an on-line data collection and analysis process. On-line teacher self-assessments will be piloted in two districts and one regional curriculum consortium in the spring of 2000. No other content area self-assessments are planned as of this date.

Although much uncertainty of current professional development needs was eliminated through the 1999 Montana ESEA Title II Eisenhower Study, further inquiry will lead to understanding the reasons for some of the more startling findings. The author recommends focus group interviews with the following format:

- ◆ Grades K-1 teachers discussing their role in the teaching of reading with regard to State Standards Benchmarks.
- ◆ Grades 9-12 high school teachers discussing their role in the teaching of reading with regard to State Standards Benchmarks.
- ◆ Grades K-12 teachers, in standards-level subgroups, discussing their current resources for teaching probability and statistics and geometry for ALL students.
- ◆ Grades 9-12 teachers discussing the nature and quality of their own professional development.
- ◆ School administration and central office staff discussing their understanding of job-embedded, ongoing professional development.

1999 MONTANA ESEA TITLE II EISENHOWER STUDY

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1999 MONTANA ESEA TITLE II EISENHOWER STUDY EXECUTIVE SUMMARY

Background Information

In April of 1999, the Montana Eisenhower Program conducted a comprehensive survey to determine mathematics and reading content and pedagogy needs of Kindergarten (K) – grade 12 teachers of mathematics and reading. The survey also provided a means to evaluate professional development quality with regard to the Montana Eisenhower Program's four indicators of quality.

Study Intent

The primary intent of the survey was to gather baseline census data for each district. The Montana ESEA Title II Professional Development Study is a tool to assist in planning state and district professional development as the state and districts transition from Montana's Model Learner Goals to Montana's Content and Student Performance Standards. Once state and district assessments are aligned to the standards, student achievement data will be used as a primary planning tool. The survey will also be used for longitudinal studies and as a complementary planning tool. Implementation of the survey will also provide grades K-12 teachers of mathematics and reading the opportunity to reflect on the newly revised Mathematics and Reading Content Standards.

Study Objectives

1. Identify needs related to teacher content knowledge of the concepts and skills (benchmarks) in the newly revised Mathematics and Reading Content Standards.
2. Identify current instructional challenges found within the Mathematics and Reading Standards.
3. Identify grade levels that **DO** and do **NOT** currently teach the benchmarks found within the Mathematics and Reading Standards.
4. Identify areas for improvement of overall professional development quality.

Rate of Response

Districts were required to return 75 percent of the reading and mathematics surveys they requested in order to receive a data report. The OPI delivered 2,823 total surveys. The rate of response was 73%.

- ♦ 2,047 grades K–12 teachers responded to the survey.
- ♦ 1,131 grades K–4 teachers responded.
- ♦ 625 grades 5–8 teachers responded.
- ♦ 291 grades 9–12 teachers responded.

PROFILE OF PARTICIPANTS

Participating Teachers of Mathematics and Reading By Grade Level

Grade Level(s) Taught	Number In State *	Number Participating In Survey	Number Of Math Respondents	Number Of Reading Respondents	Percentage Of State Total Participating *
K-4	3,622	1,131	1,065	1,037	32%
5-8	1,979	625	505	475	32%
9-12	981	291	221	101	30%

*Approximations (see Appendix B of Comprehensive Report for details).

- ◆ The number of teachers in each grade level is an estimation derived from the Montana Statewide Educational Profile (see Appendix B of Comprehensive Report).
- ◆ Totals for grades 5–8 were taken from grades 5 and 6 self-contained and grades 7 and 8 mathematics, English and Title I.
- ◆ Totals for grades 9–12 were taken from mathematics, English and Title I.

Profile of Regional Participation (see Appendix E of Comprehensive Report for details)

There are nine designated Montana Association of School Superintendents (MASS) Regions in Montana.

- ◆ The largest percentages of participating districts were from the Northwest MASS Region, with 88 percent of its eight districts participating.
- ◆ The second largest percentages of participating districts were from the Central MASS Region with 50 percent of its districts participating.
- ◆ The smallest percentages of participating districts were in the Hi-Line region.
- ◆ With the exception of the Hi-Line region, 15 percent of the districts in each MASS Region participated in this survey.

Profile of Responding Districts by Size (see Appendix D of Comprehensive Report for details)

Participating districts represented all levels of size, demographics, and locations throughout Montana (see Comprehensive Report for details).

- ◆ The largest percentages of participating districts were elementary districts with greater than 2,500 students (Size Category 1E) and high school districts with greater than 1,250 students (Size Category 1H). Seventy-seven percent of the 12 Size 1E and 1H districts participated.
- ◆ The second largest percentages of participating districts were in the third size category with 401-850 elementary students (Size Category 3E) and 204-400 high school students (Size Category 3H). Thirty-nine percent of the 44 Size 3E and 3H districts participated.
- ◆ The smallest percentages of participating districts were elementary schools of fewer than 40 students (Size Category 6E). With the exception of the Size 6E, at least 15 percent of all districts of each size participated in the survey.

Limitations

This data was not drawn from a random sampling; thus, information will most accurately reflect the needs of participating districts.

Overview of Teacher Self-Assessment Findings Indicating Capacity to Implement Newly Revised Mathematics and Reading Standards

Montana has long enjoyed its place among the top performing states in the nation with regard to student achievement on nationally recognized measures. Education is valued in Montana as demonstrated by our students' successes. Thus, it is important to recognize and identify strengths in the current system and in the newly revised standards. These strengths give us a picture of the foundation that is already in place in order to support the successful implementation of the newly revised Mathematics and Reading Content Standards. This study was designed to provide baseline data concerning teacher needs for professional development. Some of the findings of the Teacher Self-Assessment indicated a strong capacity to successfully implement the newly revised standards including:

- ◆ 100 percent of the 2,047 teachers surveyed understood the meaning of 100 percent of the benchmarks within the newly revised Mathematics and Reading Standards.
- ◆ Overall, K– 4 teachers were comfortable with their own content knowledge of over 85 percent of the Mathematics and Reading Benchmarks.
- ◆ With the exception of grades 9–12 Reading Benchmarks, 100 percent of the benchmarks are already being taught by at least 85 percent of the teachers in at least one grade within each of the content standard levels (K– 4, grades 5-8, grades 9-12).
- ◆ Teachers in at least one grade from K– 8, report that with instruction and practice, students do not have a difficult time learning 75 percent of the Mathematics and Reading Benchmarks.
- ◆ 70 percent agreed that their professional development experiences in subject content, teaching strategies and uses of technology helped them develop the skills necessary for teaching to high standards. For other professional development strengths see page 9.

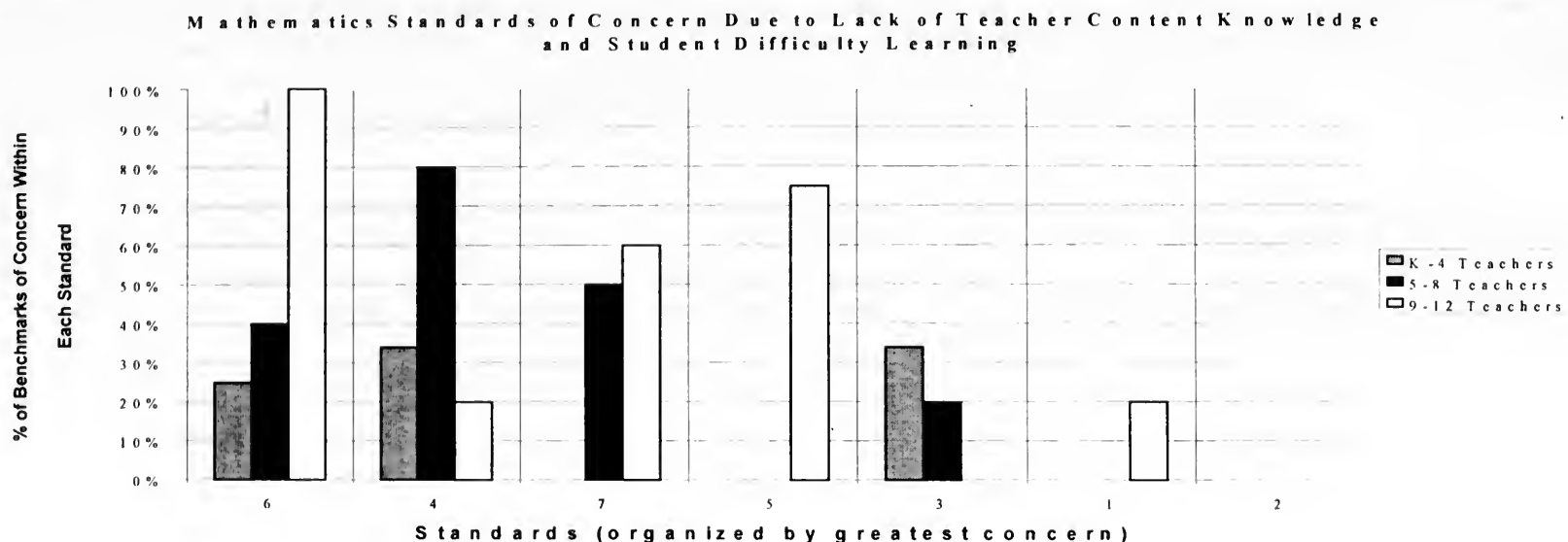
Increased Awareness of Standards through Survey Implementation:

Approximately 614 of the teachers surveyed had reviewed the Reading and/or Mathematics Content Standards prior to completing the survey. There were 1433 teachers who read and reflected on the standards for the first time. An average of 30 percent of both the reading and mathematics teachers surveyed at all grade levels were aware of the new standards.

Kindergarten – Grade 12 Mathematics Findings

- ◆ **Mathematics Standard 6**, “Students demonstrate an understanding of and an ability to use data analysis, probability, and statistics” was reported as being of greatest concern to teachers of grades K-12.
- ◆ Teachers in all grade levels felt uncomfortable with their own content knowledge of at least one of the benchmarks, and many teachers are not teaching the benchmarks found in **Standard 6**.
- ◆ Another concern for teachers in all grade levels is **Standard 4**, “Students demonstrate an understanding of shape and an ability to use geometry.”
- ◆ When teachers are teaching the benchmarks of concern in **Standards 6** and **4** they feel that even with instruction and practice, students have a difficult time learning the concepts and skills.

The table below illustrates the percentage of benchmarks within each standard that are of concern to teachers because of their own content knowledge and their students' ability to learn the content or skill.



Recommendations for a Broad-Scale Mathematics Professional Development Initiative

The need for a statewide, long-term effort to raise ALL teachers' content comfort in the area of Mathematics **Standard 6**, data analysis, probability and statistics, and **Standard 4**, geometry, is clearly evident. There is also a need for a grades K-8 effort to increase content knowledge in the area of **Standard 3**, algebraic process. Also apparent is the need for increased content knowledge of grades 5-12 teachers in **Standard 7**, functions, and grades 9-12 teachers in **Standard 5**, measurement. (For a complete list of recommendations for K-12 Professional Development see the Comprehensive Report.) The Montana Eisenhower Advisory Team Survey Analysis Committee recommendations include:

- ♦ Any entity involved in long-range professional development planning in the area of mathematics must address these critical areas of concern in order to build the capacity of ALL teachers to teach ALL students to high standards.
- ♦ Preservice, as well as ongoing professional development initiatives should be viewed as priorities for focused, content-rich professional development in the area of mathematics.
- ♦ Partnerships between mathematics professors, mathematics education professors and Montana districts must be developed in order to address these content issues in a timely fashion.

- ◆ District curriculum planning should involve thoughtful dialogue about appropriate scope and sequence with regard to the standards regardless of textbook content. Additional materials and/or new teaching materials may be necessary when planning curriculum aligned to Montana's Student Content and Performance Standards.
- ◆ Statewide and district assessments should also be evaluated for their ability to assess the content and skills within these benchmarks. Many of the benchmarks of concern within these standards are of higher-order thinking skills, and may be difficult to assess with paper and pencil tests.
- ◆ Integration of difficult Mathematics Standards into science, technology, and applied science classes will prove to be beneficial to students who have a difficult time learning the content or skill. Real-world application of data analysis, statistics, geometry, and measurement seem a natural fit for this type of integration. Cross-curricular teams of teachers working together to assist ALL students in the learning of these concepts and skills may go far in solving the problems of successful teaching of Montana's Mathematics Standards.

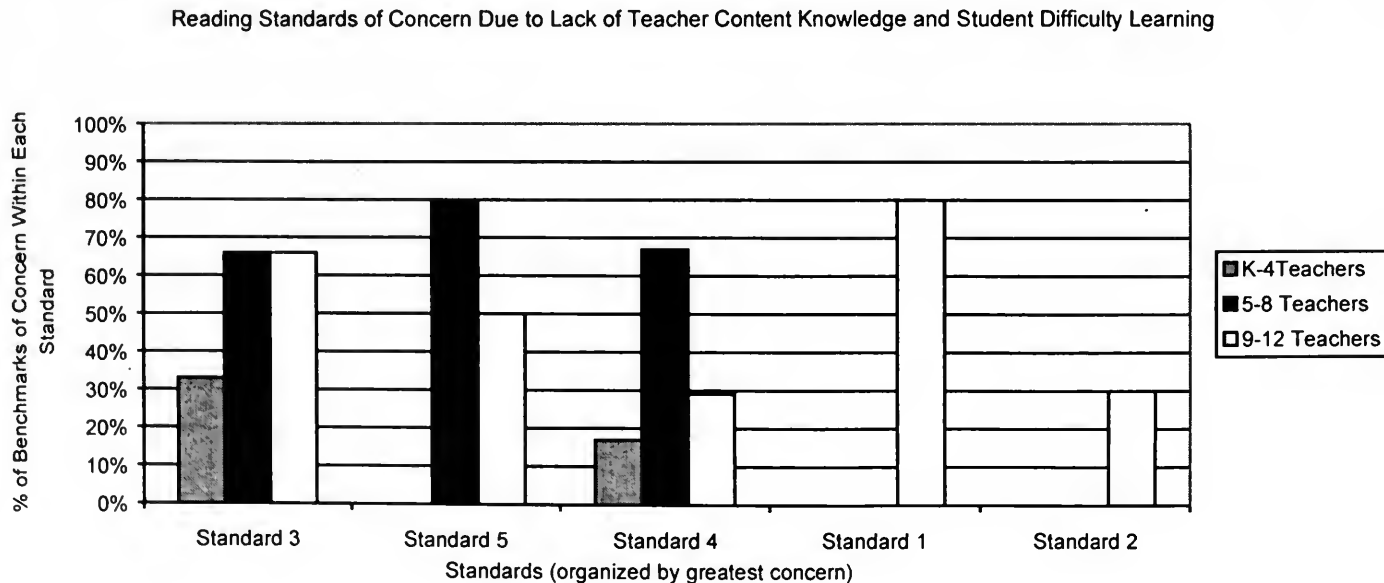
Conclusion

First and foremost is the need to address the lack of content knowledge many Montana grades K-12 teachers are experiencing as they attempt to implement Montana's newly revised Mathematics Standards. For all of the benchmarks that teachers reported deficiencies in content knowledge, a greater number reported that they were either **NOT** teaching the benchmark or that even with instruction and practice, students were having a difficult time learning the benchmark. Most of the mathematics benchmarks of concern were directly related to higher-order thinking and understanding. Teachers who do **NOT** have a conceptual understanding of mathematics will teach the mechanics of mathematics and will not be able to teach students to synthesize their understanding of mathematics concepts.

Kindergarten – Grade 12 Reading Findings

- ◆ Reading Content **Standard 3**, “Students set goals, monitor, and evaluate their progress in reading,” was reported as being of greatest concern to teachers of grades Kindergarten (K) – grade 12.
- ◆ Teachers in all grade levels felt uncomfortable with their own content knowledge of at least one of the benchmarks, and many teachers are not teaching the benchmarks found in **Standard 4**, “Students select, read, and respond to print and non-print material for a variety of purposes.”
- ◆ When teachers are teaching the benchmarks of concern in **Standards 3 and 4** they feel that even with instruction and practice, students have a difficult time learning the concepts and skills.
- ◆ **Standard 5**, “Students gather, analyze, synthesize, and evaluate information from a variety of sources, and communicate their findings in ways appropriate for their purposes and audiences,” is of great content concern to teachers of reading grades 5–12.
- ◆ Of the teachers of reading grades K–12, grades 9–12 teachers had the greatest concerns about their own knowledge of the content and skills found in the standards. Content concerns were identified in each of the five standards.
- ◆ Over **50 percent** of All grades 9–12 survey respondents reported **NOT** teaching **100 percent** of the Reading Benchmarks.

The table below illustrates the percentage of benchmarks within each standard that are of concern to teachers because of their own content knowledge and their students’ ability to learn the content or skill.



Recommendations for a Broad-Scale Reading Professional Development

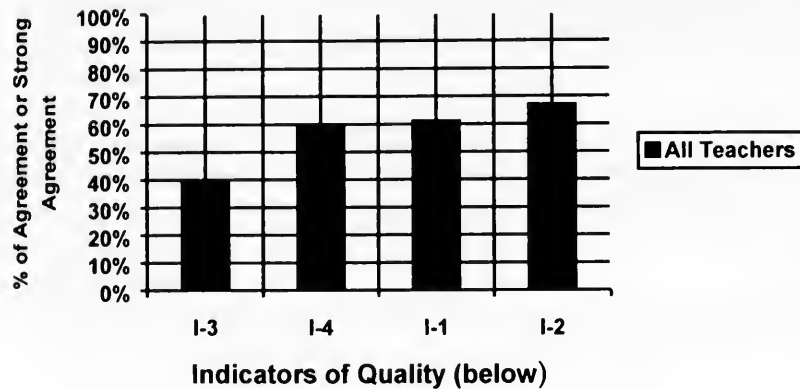
The survey data strongly indicates the need for a content-rich, statewide, long-term, sustained effort to increase grades K-12 teacher knowledge of two of the Reading Content Standards: **Standard 3**, “Students set goals, monitor, and evaluate their progress in reading,” and **Standard 4**, “Students select, read, and respond to print and non-print material for a variety of purposes.” For a complete list of recommendations for K-12 Professional Development see the Comprehensive Report. Montana State Reading Council Survey Analysis Committee recommendations include:

- ◆ Any entity involved in long-range professional development planning for reading instruction must address the identified critical areas of concern (**Standards 3 and 4**) in order to build the capacity of all teachers to teach ALL students to high standards.
- ◆ Content-rich professional development for middle grade and high school teachers concerning **Standard 5**, “Students gather, analyze, synthesize, and evaluate information from a variety of sources, and communicate their findings in ways appropriate for their purposes and audiences.”
- ◆ Awareness building activities for Kindergarten and grade 1 teachers concerning their contribution to teaching the benchmarks and skills found in the reading standards.
- ◆ The topic of teaching reading at the high school level must be addressed. Who teaches reading content and skills as students enter the final years of their formal education and how these skills are to be taught should be a part of all district and state discussions concerning the implementation of the Reading Standards. If it is believed that ALL teachers are teachers of reading, then professional development for ALL high school teachers in the content of the standards and proven practices in teaching reading to older students must occur. Implementation of these standards is seen as the greatest challenge at the high school level because of the number of teachers who are not comfortable with their own content, and the alarmingly high percentage of teachers who are **NOT** teaching the 9-12 Reading Standards.
- ◆ Preservice, as well as ongoing professional development initiatives, should view these areas of reading as priorities for focused, content-rich professional development. Partnerships between reading professors, content-area education professors, Montana districts and professional organizations must be developed to address these issues in a timely fashion.
- ◆ District curriculum planning should involve thoughtful dialogue about appropriate scope and sequence with regard to these identified standards and benchmarks. Additional materials and/or new teaching materials may be necessary when planning district curriculum aligned to Montana’s Student Content and Performance Standards.
- ◆ Statewide and district assessments should also be evaluated for their ability to assess the content and skills within these benchmarks. The benchmarks within these standards are of higher-order thinking skills and may need to be tested and evaluated using a variety of performance assessment tools.

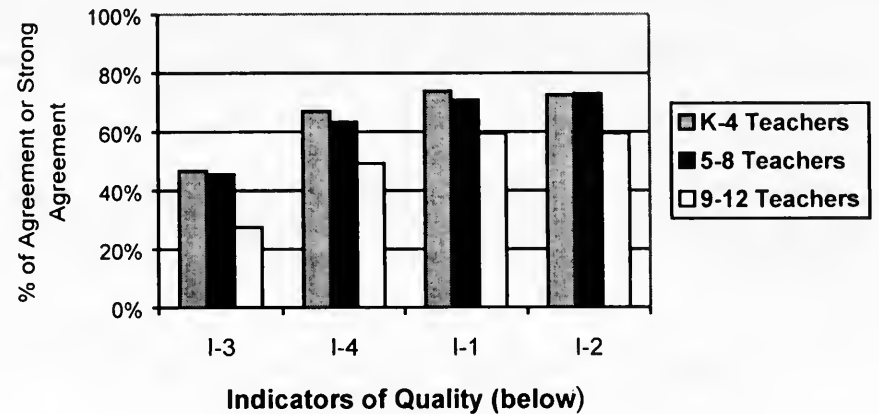
Professional Development Quality Teachers of Kindergarten – Grade 12 Mathematics and Reading

Indicators of Quality

**K-12 Assessment of Professional Development
Experiences With Regard to Four Indicators of
Quality**



**K-12 Assessment of Professional Development
Experiences Disaggregated By Grade Level**



The four Indicators of Quality used for survey purposes are:

- I-1) Professional Development focusing on individual, collegial and organizational improvement.**
- I-2) Professional Development focusing on high standards and reflecting best research in teaching and learning.**
- I-3) Professional Development supporting the implementation of new teaching strategies through ongoing, collaborative professional development activities.**
- I-4) Professional Development is determined through a data collection and analysis process.**

In order to evaluate current professional development with regard to the above indicators, survey participants were asked to respond to 14 statements aligned to the four Indicators of Quality listed above. Teachers responded in agreement or disagreement to three or four statements reflecting each of the Indicators of Quality (see Comprehensive Report for specific statements with percentage of agreement).

Professional Development System Strengths

The statements most teachers of reading and mathematics agreed or strongly agreed to **most often** were descriptors of professional development that focus on high standards and reflect best research in teaching and learning (Indicator 2).

- ◆ 82 percent of all teachers surveyed agreed or strongly agreed that their own professional development activities encouraged teachers to be active, investigative and reflective practitioners.
- ◆ 70 percent agreed that their professional development experiences in subject content, teaching strategies and uses of technology helped them develop the skills necessary for teaching to high standards.

Teachers also **often agreed** to the statements that indicated that professional development supports overall improvement (Indicator 1).

- ◆ 77 percent agreed that their professional development focuses on individual, collegial and organizational improvement.
- ◆ 75 percent agreed that professional development focuses on teachers as central to student learning yet includes all members of the school community.

Professional Development System Weaknesses

The statements most teachers of reading and mathematics agreed or strongly agreed to the **least often**, were descriptors of professional development that support the implementation of new teaching strategies through ongoing, collaborative professional development (Indicator 3).

- ◆ 47 percent agreed that their professional development supports them during implementation into institutionalization of new content and teaching strategies.
- ◆ 44 percent agreed that they are involved in collaborative planning on a weekly basis.
- ◆ 30 percent agreed that they were organized into support teams during the implementation of new content and/or teaching strategies.

Grade Level Differences

- ◆ Although the ranking of categories by agreement is the same for all three grade levels (K-4, 5-8, 9-12), over 10 percent fewer high school teachers agreed or strongly agreed in any category.
- ◆ In the descriptors of professional development focused on individual, collegial and organizational improvement (the highest of all the overall categories) only 59 percent of the high school teachers were in agreement.
- ◆ In the descriptors of professional development that supports the implementation of new teaching strategies, only 28 percent of the high school teachers were in agreement (see Comprehensive Report, page 41, for details).

Recommendations for Improving Montana's Professional Development System

In all professional development planning, an effort must be made to continue to provide quality delivery of new content and strategies aligned to individual, collegial and organizational improvement. Current policies and practices that have supported such professional development must be maintained as the state and districts reform their professional development systems. As the state, districts and associations work to improve Montana's professional development system, the addition of time and funding allocated for collaborative, ongoing activities following any out-of-building professional development is necessary for ALL teachers to implement new content and teaching strategies into their classroom. All staff, school board members, parents and the community must be made aware of the need to support teachers as they implement new standards and new practices. State and local policies and funding decisions must be made to support ongoing, job-embedded professional development if ALL students are to be proficient in ALL standards.

These recommendations imply that professional development is the ongoing development of teacher content knowledge and teaching skills. Staff development cannot be confined to a few specific days in the school calendar, but must be viewed as a process that is based on the continuous evaluation of teaching strategies and content knowledge. High quality delivery of professional development content appears to be the norm throughout Montana. The addition of collaborative follow-up activities for teachers following conferences and workshops will build upon that strength and thereby increase the effectiveness of the professional development system.

